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td-net
Network for Transdisciplinary Research

Best Practice in Transdisciplinary Research – Swiss *td-award* Winners 2013

Transdisciplinary research plays an increasing role in topics of societal relevance and impact. The td-net *of the Swiss Academies of Arts and Sciences awards innovative transdisciplinary research every other year. The last* td-award *was given in 2013. This special focus of* GAIA *features the six prize-winning projects, presenting short summaries of their work. Explaining its selection in the following introduction, the Jury of the* td-net *honours the awardees, and puts their work into a global perspective.*

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Members of the Jury of the Swiss td-award

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The demand, over the last decades, for inter- and transdisciplinary approaches in academic research and teaching may be seen as a reaction to the fast increase in knowledge within the special disciplines on the one hand, and to the growing complexity of social and environmental problems on the other hand. Not only the current demographic change with its far-reaching implications but also global natural resource crises received increasing attention from policy circles worldwide. With the recognition of the limits of growth in the second half of the 20th century it became clear that the complexity of the interactions between societal developments and natural resource systems required a new kind of systemic thinking across different academic disciplines as well as involving societal actors like communities, industry and authorities. This call for a more holistic knowledge production model has haunted academic circles, funding agencies and science policy institutions ever since, and gave rise to a broad variety of new modes of knowledge production. In the United States the term of "team science" has more recently found resonance. British researchers have been more motivated by concepts of "public engagement of science". In mainland Europe and particularly in the German speaking countries, the concept of transdisciplinary research has been developed over the past two decades. In accordance with the *Network for Transdisciplinary Research of the Swiss Academies (td-net)* "transdisciplinarity" is defined as a form of research that transcends disciplinary boundaries to address and to solve problems related to the life world. Science is seen as being part of societal processes, attributing meaning to knowledge for societal problem-solving, and scientists entering into dialogue and mutual learning with societal stakeholders.

The *td-net* was initiated 2003 by the Swiss Academies of Arts and Sciences to support foresight and the dialogue between science and society. As a platform, *td-net* advances the mutual learning between inter- and transdisciplinary researchers across thematic fields, languages and countries and thereby supports community building. As centre of competences, the *td-net* disposes of expertise, methods and tools for coproducing knowledge. By use of these competences *td-net* supports inter- and transdisciplinary projects in research and teaching in order to bring them to fruition.

One of its instruments is the *swiss-academies award for transdisciplinary research – td-award,* which prizes outstanding conceptual and methodological transdisciplinary research projects in all thematic fields. The biennial *td-award* is supported with totally 75,000 Swiss francs by the Mercator Foundation Switzerland. The overall aim of the award is to highlight outstanding transdisciplinary research projects and to increase visibility of transdisciplinary research within academia. The *td-award* helps specifying transdisciplinary research and ensuring this mode of research gains recognition. It also motivates researchers to push the boundaries >

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of transdisciplinary research. Currently the award is split into three categories: a *distinguished achievement* award, an *early career recognition* and a *life-time achievement*. To participate, the applicants must be based in a Swiss academic research institution. Assessment criteria are: innovative framing of a complex problem, co-production of knowledge between several disciplines and the inclusion of diverse stakeholders and their perspectives. Further, an exemplary approach to reach societal impact, or balancing scientific rigor and societal relevance should be demonstrated. Emphasis is put on the promotion of young scientists towards the creation of a lasting community of practice of transdisciplinary research.

In its fourth edition, the 2013 *td-award* had to select among 26 high level applications, making the selection of awardees a difficult choice. It appears that transdisciplinary research approaches are established more and more in various realms. This is reflected by applications from such diverse disciplines as the arts, theology, neuroscience and geo-spatial sciences. Six projects have been awarded (see figure).

The ***distinguished achievement*** was awarded to the *Mountland* project carried out by a consortium of several research institutes from the Federal Institute of Technology Domain and headed by the Swiss Federal Institute for Forest, Snow and Landscape Research WSL. The *Mountland* project furthermore involved a wide range of stakeholders in different mountain regions: local authorities, private sector and representatives of the civil society in the cantons of Vaud, Valais and Grisons in Switzerland. The project aimed at identifying options for sustainable land use in fragile mountain regions. Thereby an integrated approach was developed to study the dynamics of ecosystems, which may suffer in the future from impacts of global environmental change and socio-economic transformations. The consortium was awarded for its innovative co-production of knowledge between different disciplines and the successful inclusion of actors from various parts of civil society. Seemingly the process of consensus finding of locally adapted land use strategies was difficult and time consuming. However, it resulted in new locally adapted policies that have been developed together with the concerned actors.

Distinctions of nomination were awarded to two international networks, namely *Mountain Invasion Research Network (MIREN)*, coordinated by the Federal Institute of Technology in Zurich (ETH Zurich), and *drugNET-WWA – illicit drug monitoring network using wastewater analysis*, co-founded by the Federal Institute of Aquatic Science and Technology (Eawag). *MIREN* is a global network for research of invasive plants and biodiversity in mountain regions. It is active in eleven regions of the world in North and South America, Europe, India, South Africa and Australia. ***Christoph Kueffer*** of the Institute of Integrative Biology at ETH Zurich coordinates the program. He is commended for his outstanding transdisciplinary achievement associated to his organizational and diplomatic skills. The *drugNET* project investigates in an innovative way the consumption of illicit drugs by detecting their metabolites and residuals in waste water. In this way metabolites of illicit drugs can provide information of their consumption in whole city quarters. The project works with partners in 100 cities in North America, Australia and Europe. The *drugNET* was commended by the

Robert Huber, Andreas Rigling: ***Commitment to Continuous Research Is a Key Factor in Transdisciplinarity. Experiences from the Mountland Project***
▸ *p. 256*

Christoph Kueffer, Curtis Daehler, Hansjörg Dietz, Keith McDougall, Catherine Parks, Aníbal Pauchard, Lisa Rew, MIREN Consortium: ***The Mountain Invasion Research Network (MIREN). Linking Local and Global Scales for Addressing an Ecological Consequence of Global Change***
▸ *p. 263*

FIGURE: *td-award* 2013 award ceremony in Bern (from left to right): Pasqualina Perrig-Chiello, Jakob Zinsstag, Bernhard Truffer (Jury members), Andreas Rigling, Robert Huber, Hans Hurni, Tobias Mettler, Christoph Küffer, Oliver Streiff (awardees), Therese Frösch (laudation, vice president HELVETAS), Christoph Ort, Urs Wiesmann (awardees).

Jury for its very innovative approach by constituting an international interdisciplinary research consortium that addresses a highly relevant problem field. Even though at this stage *drugNET* is not yet a fully developed transdisciplinary program, it represents a highly original initiative, which has the potential to prove the added value of transdisciplinary research in the future.

Common to all three projects is the fact that they could build on formerly built transdisciplinary experience in their respective home institutions. This stands in contrast to earlier awarded projects, which were more "heroic" single enterprises.

Christoph Ort, Caleb J. Banta-Green, Lubertus Bijlsma, Sara Castiglioni, Erik Emke, Coral Gartner, Barbara Kasprzyk-Hordern, Malcolm J. Reid, Jörg Rieckermann, Alexander L. N. van Nuijs: ***Sewage-based Epidemiology Requires a Truly Transdisciplinary Approach***
▸ *p. 266*

Early career awards were received by ***Oliver Streiff*** and ***Tobias Mettler,*** both of the University of St. Gallen. Streiff addresses the societal debate on the quality of the built environment. Notably he investigates the interaction of law and the architectural space. He elaborates an original approach on how to bring interdisciplinary perspectives to inspire lawmaking.

Oliver Streiff: ***Reflecting on Law and the Quality of the Built Environment. A Transdisciplinary Perspective***
▸ *p. 269*

Mettler addressed the potential of innovation at the intersection between management and healthcare. Future healthcare is not necessarily lacking good quality drugs and vaccines. The bottleneck for future healthcare is rather the effectiveness at the health system level. For example, health system management has to address surging costs and the lack of qualified health workers. Public and private stakeholders have to engage to identify innovative solutions for the provision of future healthcare at high coverage.

Tobias Mettler, Peter Rohner, Robert Winter: ***Transdisciplinary and Transformative Research at the Intersection between Management, Healthcare, and Innovation***
▸ *p. 272*

The award for a ***life-time achievement*** went to ***Hans Hurni*** and ***Urs Wiesmann*** of the Centre for Development and Environment (CDE) at the University of Bern, former directors of the research program *National Centre of Competence in Research North-South (NCCR North-South)*. Their remarkable achievement was to manage a program consisting of over 1,000 researchers on all continents – except Australia – funded by the Swiss Development Cooperation and the Swiss National Science Foundation. Relevant for the *td-award* was that they were committed to a transdisciplinary approach from the beginning of the program, engaging with stakeholders and scientists in respective areas of case studies. This has led to local problem identification and ownership of problem-solving approaches. A main outcome was on the one hand a large number of young scientists from industrial and developing countries acquainted with methods of engaging science with society for sustainable development. On the other hand their engagement led to the establishment of a new academic inter- and transdisciplinary core competencies and mission of the CDE at the University of Bern. By this, the two awardees were able to create a steady institutional environment in which transdisciplinarity competences can be maintained and further developed.

Hans Hurni, Urs Wiesmann: ***Transdisciplinarity in Practice. Experience from a Concept-based Research Programme Addressing Global Change and Sustainable Development***
▸ *p. 275*

Awardees are expected to act as ambassadors of transdisciplinarity. The present ***SPECIAL FOCUS*** of *GAIA* is an opportunity to fulfil this ambassadorial role. They can be proud of receiving the biggest award of the Swiss Academies, and we hope that this motivates young academics to engage in transdisciplinary research activities. Each contribution to this special focus demonstrates the added value of transdisciplinary research as compared to conventional academic research, in terms of multi-actor knowledge generation and societal problem solving. They in particular provide lessons for other researchers working in similar transdisciplinary settings.

Where is the future of transdisciplinary research? Where are we heading to? What is our vision? The above examples point towards a high potential of transdisciplinary research approaches for societal problem solving. The experiences of the *NCCR North-South* also show that transdisciplinary processes are part of an iterative research process between the involvement of stakeholders and of cutting edge disciplinary research. A career profile emerges where scientists acquire the competence to work between different academic disciplines but also between stakeholders in society and the private sector.

Interestingly, the continental understanding of transdisciplinary research contrasts comparable approaches like "team science" in the United States or "public engagement of science" in the United Kingdom. *Team science* largely concentrates on bibliographic and bibliometric analysis, showing that teams of scientists are more successful and innovative than individual scientists. Their focus remains in a purely academic circle. *Public engagement of science,* as promoted, for example, by the *Wellcome Trust,* involves civil society in problem identification and the communication of scientific results.

In contrast, continental European and Swiss transdisciplinary research shows how non-academic actors are embedded in participatory research processes and contribute to the co-production of knowledge that could not be achieved by academia alone. Transdisciplinary approaches are increasingly used in European research frameworks and start to show their power to contribute to the solving of societal problems. In our experience there remains a huge untapped potential of societal impact and sustainable development in developing and industrialized countries from transdisciplinary research. This special *GAIA* focus provides a flavour and calls for more.